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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,167	06/08/2001	Edward W. Sheehan		9295

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EXAMINER	
PHAM, HAI CHI	
ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 04/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/877,167	SHEEHAN ET AL.
	Examiner	Art Unit
	Hai C Pham	2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11-21,23,24 and 26* is/are rejected.

7)☒ Claim(s) *10,22 and 25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 June 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "**voltage supply**" must be shown or the feature canceled from the respective claims **1**, **13**. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. The following claims are objected to because of the following informalities:

Claim 10:

- Line 3, "and shape. Ions" should read –and shape, ions--,
- Line 5, "apertures and tubes" should read --apertures or tubes--.

Claim 25:

- "said electric field" should read --said electrostatic field-- to keep the consistency of the terms that define each claimed element.

Appropriate correction is required.

Claim R j ctions - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1;

- The phrase "**and/or**" at line 1 renders claim 1 indefinite because the claim does not clearly set forth the metes and bounds of the claimed invention, thereby rendering the scope of the claim unascertainable.
- The following limitations "said surface" at lines 14 and 18 appear to be ambiguous in that it is not known whether the claimed surface is the "target surface" or the "conductive high transmission surface". On the other hand the following recited "surface" at lines 6, 8, 9, 10 should read --high transmission surface--.

Claim 3:

- Similarly, "said surface" at line 3 is unclear in that it is not known whether the claimed surface is the "target surface" or the "conductive high transmission surface".

Claim 8:

- The phrase "**such as**" at line 2 renders claim 8 indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 11:

- The following recitation "a pure gas supplied in such a way ..." attempts to define the supply of the pure gas but fails to provide any further details. It is suggested to deleted "in such a way" such that the limitation is positively recited.
- "said surface" at line 5 is unclear in that it is not known whether the claimed surface is the "target surface" or the "conductive high transmission surface".

Claim 13:

- "said surface" at line 13 is unclear in that it is not known whether the claimed surface is the "target surface" or the "high transmission surface".

Claim 14:

- Similarly, "said surface" at line 3 is unclear in that it is not known whether the claimed surface is the "target surface" or the "conductive high transmission surface".

Claim 15:

- The phrase "**such as**" at line 2 renders claim 15 indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 18;

- The phrase "**and/or**" at line 1 renders claim 18 indefinite because the claim does not clearly set forth the metes and bounds of the claimed invention, thereby rendering the scope of the claim unascertainable.
- The following limitation "said surface" at line 18 appears to be ambiguous in that it is not known whether the claimed surface is the "target surface" or the "conductive high transmission surface". On the other hand the following recited "surface" at lines 6, 8, 9 should read --high transmission surface--.

Claim 19:

- The phrase "**such as**" at line 4 renders claim 19 indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 26:

- The following recitation "a pure gas supplied in such a way ..." attempts to define the supply of the pure gas but fails to provide any further details. It is suggested to deleted "in such a way" such that the limitation is positively recited.

Claims 2, 4-7, 9-10, 12, 16-17, 20-25 are dependent from claims 1, 13, 18 above, and are therefore indefinite.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 3-8, 11-15, 18-21, 23, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jarrell et al. (U.S. 5,306,910) in view of Labowsky et al. (U.S. 4,531,056).

Jarrell et al. discloses a method and apparatus for analyzing solutes in a sample solution connected to a mass spectrometer, the apparatus comprising a dispersive source of ions (grid 50, Fig. 2), a conductive high transmission surface (conductive plate 30) having hole (33) through which ions pass unobstructed on the way to a collector target or aperture (19), the high transmission surface being supplied with an attracting electric potential by connection to a voltage (not shown), and generating an electrostatic filed between the source of ions and the top side of the high transmission surface (col. 8, lines 40-42), the high transmission surface being shaped to affect high focusing fields on the focusing side of the high transmission surface, a target surface (skimmer 18) for receiving ions or transmitting focused ions through target apertures (19) and having a second ion-attracting potential by connection to the power supply (col. 8, lines 43-56).

However, Jarrell et al. fails to teach the conductive high transmission plate (conductive plate 30) having a plurality of holes through which ions passed unobstructed, and the target surface being hold at a higher potential.

Regardless, Labowsky et al., an acknowledged prior art, discloses a method and apparatus for the mass spectrometric analysis of a sample dissolved in a solution by means of electrospray ionization, the apparatus including a perforated diaphragm (17)

serving as an electrostatic focusing electrode, the diaphragm having a plurality of holes with the largest hole at its center (col. 10, lines 29-45), as well as the target surface (plate 22 with aperture 23) being served to focus the ion beam into mass spectrometer (29), the plate (22) being maintain at a relative different potential, as compared to the electrostatic focusing element pairs (1, 17), and having a polarity depending on the types of ions -negative or positive ions- produced by the capillary (15).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Jarrell et al. with the aforementioned teachings of Labowsky et al. The motivation for doing so would have been to maximize the generation of ions of the electrospray source as indicated by Labowsky et al. at col. 7, lines 5-19.

With regard to claims 3-8, 11-12, 14-15, 19-21, 23, 26, Jarrell et al. further discloses:

- the inner field-shaping electrode (18) being a metal electrode and having a single central aperture (19),
- the plates (30 and 18) being maintained at the same potential (col. 8, line 66 to col. 9, line 5),
- an analytical apparatus in communication with the target surface (18) (Fig. 2),
- the analytical apparatus being a mass spectrometer (22),
- the analytical apparatus being an ion mobility spectrometer (col. 10, lines 63-64),
- the gas-phase ions being formed by an atmospheric or near atmospheric ionization source,

- a pure gas (dry heated gas) being supplied opposed to the flow of the liquid sample (col. 11, lines 12-15),
- an outer field-shaping electrode (3) surrounding the high transmission surface (30) having the same potential as the high transmission surface (wall portion 3 may be electrically or mechanically part of the plate 30) (col. 9, lines 3-5).

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jarrell et al. in view of Labowsky et al., as applied to claim 1 above, and further in view of Kato et al. (U.S. 5,581,081).

Jarrell et al. in view of Labowsky et al. discloses all the basic limitations of the claimed invention except for the target surface having a conductive end of a capillary tube.

Kato et al. discloses a method and apparatus for direct coupling of liquid chiromatograph and mass spectrometer, the apparatus comprising a dispersive source of ions (10), the conductive high transmission surface (141) and the target surface (161), which has a central aperture or fine hole (16) that could be substituted by a capillary tube (col. 18, lines 59-67) through which the focused ions are introduced into the mass spectrometer portion.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a capillary tube at the target surface as taught by Kato et al. in the modified device of Jarrell et al. The motivation of doing so would have been to selectively sample and ionize a desired diameter of droplets.

8. Claims 9, 16, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jarrell et al. in view of Labowsky et al., as applied to claims 1, 8, 13, 15, 18 above, and further in view of Moini et al. (U.S. 6,465,776 B1).

Jarrell et al. in view of Labowsky et al. discloses all the basic limitations of the claimed invention except for the plurality of ion sources.

Moini et al. discloses a mass spectrometer apparatus for analyzing multiple samples concurrently comprising a plurality of atmospheric pressure inlets as electrospray ionization spray devices (54) to provide multiple streams of different fluid samples (10).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a multiple ion sources as taught by Moini et al. in the modified device of Jarrell et al. The motivation for doing so would have been to provide a technique of simultaneously analyzing multiple fluid samples, which are maintained separately with no mixing.

Allowable Subject Matter

9. Claims 10, 22, 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Claims 10, 22, 25 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the indication of the allowability of claims 10 and 22 is the inclusion of the limitation, in the combination as currently claimed, that the target surface is made up of a plurality of focal points resulting from mechanical variation of the inner field-shaping electrode position and shape, and that is not found taught or fairly suggested by the prior arts made of record, considered alone or in combination.

The primary reason for the indication of the allowability of claim 25 is the inclusion of the limitation, in the combination as currently claimed, that the electric field ratio at points equidistant from the upstream and downstream surface of the high transmission surface is greater than 10 to 1 with the focusing side having the greater magnitude, and that is not found taught or fairly suggested by the prior arts made of record, considered alone or in combination.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin R. Fuller can be reached on (703) 308-0079. The fax phone

numbers for the organization where this application or proceeding is assigned are (703) 308-7722, (703) 308-7724, (703) 308-7382, (703) 305-3431, (703) 305-3432 for regular communications and for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

HAI PHAM
PRIMARY EXAMINER

March 31, 2003